National Institute of Environmental Health Sciences

# Interrelationships among seed yield, total protein and amino acid composition of ten quinoa (Chenopodium quinoa) cultivars from two different agroecological regions

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**Abstract:**

BACKGROUND: Quinoa is a good source of protein and can be used as a nutritional ingredient in food products. This study analyses how much growing region and/or seasonal climate might affect grain yield and nutritional quality of quinoa seeds. RESULTS: Seeds of ten quinoa cultivars from the andean highlands (Bolivia/Argentina site) and Argentinean Northwest (Encalilla site) were analysed for seed yield, protein content and amino acid composition. Grain yields of five cultivars growing at Encalilla were higher, and four were lower, compared with data from the Bolivia/Argentina site. Protein contents ranged from 91.5 to 155.3 and from 96.2 to 154.6 g kg(-1) dry mass for Encalilla and Bolivia/Argentina seeds respectively, while essential amino acid concentrations ranged from 179.9 to 357.2 and from 233.7 to 374.5 g kg(-1) protein respectively. Significant positive correlations were found between the content of essential amino acids and protein percentage. CONCLUSION: It appears that there are clear variations in seed yield, total protein content and amino acid composition among cultivars from the two sites. Essential amino acid composition was more affected than grain yield and protein level. The study revealed that both environmental and climatic factors influence the nutritional composition of quinoa cultivars growing in different agroecological regions.

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## Resource Description

**Exposure :**

weather or climate related pathway by which climate change affects health

Extreme Weather Event, Food/Water Security

**Extreme Weather Event:** Drought

**Food/Water Security:** Agricultural Productivity, Nutritional Quality

**Geographic Feature:**

resource focuses on specific type of geography

Mountain

**Geographic Location:**

resource focuses on specific location

Non-United States

**Non-United States:** Central/South America

**Health Impact:** ☒

specification of health effect or disease related to climate change exposure

Health Outcome Unspecified

**Resource Type:** ☒

format or standard characteristic of resource

Research Article

**Timescale:** ☒

time period studied

Time Scale Unspecified